



Project Summary

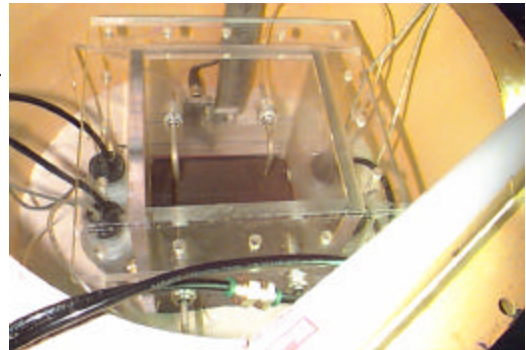
US Army Engineer
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Centrifuge Simulation of Contaminant Migration through Capped Dredged Material

Introduction: The purpose of this research is to conduct a series of studies to investigate the process of consolidation induced convection transport of contaminants from dredged material and sediments into caps. These experiments were conducted on the Army centrifuge to ensure correct physical modeling of sub-surface transport, which cannot be achieved unless self-weight is fully accounted for in the modeling technique. Typical laboratory column model of the sediment-cap prototype is incapable of simulating the stress strain history within a time frame that has practical application for cap design or cap evaluation. Standard laboratory procedures are used for estimating contaminant migration into caps by diffusion, but diffusion is not the critical process affecting capping effectiveness.



Scope of Work: Dredged material was obtained from the site for the series of experiments. The contaminated sediment is spiked with rhodamine fluorescent dye and C-14, a radiochemical tracer. The model was then placed on the centrifuge and subjected to accelerated field to simulate a field event with equivalent transport processes of 25 years. Sediment consolidation, pore water advection and radiochemical migration are monitored and measured.

Status of Project: Completed. Laboratory analysis of the overlying water and core samples showed negligible traces of C-14 in the cap layer and in the overlying water. Centrifuge test results provided physical data that compared favorably with theoretical predictions. Many aspects of site remediation can benefit from centrifuge modeling.

Point of Contact: [Wipawi Vanadit-Ellis](#), Centrifuge Research Center, (601) 634-2688